

PCT COOPERATION TREATY

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Assistant Commissioner for Patents
United States Patent and Trademark
Office
Box PCT
Washington, D.C. 20231
ETATS-UNIS D'AMERIQUE

in its capacity as elected Office

Date of mailing (day/month/year) 25 July 2000 (25.07.00)	
International application No. PCT/SE99/02175	Applicant's or agent's file reference TP 1300 WO
International filing date (day/month/year) 24 November 1999 (24.11.99)	Priority date (day/month/year) 25 November 1998 (25.11.98)
Applicant PERSSON, Kjell	

1. The designated Office is hereby notified of its election made:

☒ in the demand filed with the International Preliminary Examining Authority on:
19 June 2000 (19.06.00)

☐ in a notice effecting later election filed with the International Bureau on:

2. The election ☒ was
☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

<p>The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland</p> <p>Facsimile No.: (41-22) 740.14.35</p>	<p>Authorized officer</p> <p>Charlotte ENGER</p> <p>Telephone No.: (41-22) 338.83.38</p>
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09/850096

The demand must be filed directly with the competent International Preliminary Examining Authority or, if two or more Authorities are competent, with the one chosen by the applicant. The full name or two-letter code of that Authority may be indicated by the applicant on the line below:

IPEA/SE

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CHAPTER II

DEMAND

under Article 31 of the Patent Cooperation Treaty:

The undersigned requests that the international application specified below be the subject of international preliminary examination according to the Patent Cooperation Treaty and hereby elects all eligible States (except where otherwise indicated).

For International Preliminary Examining Authority use only	
Identification of IPEA	Date of receipt of DEMAND
Box No. I IDENTIFICATION OF THE INTERNATIONAL APPLICATION	
Applicant's or agent's file reference TP 1300 WO	
International application No. PCT/SE99/02175	International filing date (day/month/year) 24.11.1999
(Earliest) Priority date (day/month/year) 25.11.1998	
Title of invention HEAT EXCHANGER	
Box No. II APPLICANT(S)	
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.) TETRA LAVAL HOLDINGS & FINANCE SA Avenue Général-Guisan 70 CH-1009 PULLY Switzerland	
Telephone No.: +21 41 7292211	
Facsimile No.: +21 41 7292759	
Teleprinter No.: 045 455811	
State (that is, country) of nationality: CH	State (that is, country) of residence: Switzerland
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.) PERSSON, Kjell Ramshögsvägen 4 S-244 71 DÖSJEBRO Sweden	
State (that is, country) of nationality: SE	State (that is, country) of residence: Sweden
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)	
State (that is, country) of nationality:	
State (that is, country) of residence:	
<input type="checkbox"/> Further applicants are indicated on a continuation sheet.	

Box No. III AGENT OR COMMON REPRESENTATIVE; OR ADDRESS FOR CORRESPONDENCEThe following person is ☒ agent ☐ common representativeand ☒ has been appointed earlier and represents the applicant(s) also for international preliminary examination.☐ is hereby appointed and any earlier appointment of (an) agent(s)/common representative is hereby revoked.☐ is hereby appointed, specifically for the procedure before the International Preliminary Examining Authority, in addition to the agent(s)/common representative appointed earlier.Name and address: *(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)*BRUNNSTRÖM, Gunilla
AB Tetra Pak
Patent Department
Ruben Rausings gata
S-221 86 LUND
Sweden

Telephone No.:

+46 46 362323

Facsimile No.:

+46 46 137923

Teleprinter No.:

32140 TPLUND S

☐ Address for correspondence: Mark this check-box where no agent or common representative is/has been appointed and the space above is used instead to indicate a special address to which correspondence should be sent.**Box No. IV BASIS FOR INTERNATIONAL PRELIMINARY EXAMINATION****Statement concerning amendments:***

1. The applicant wishes the international preliminary examination to start on the basis of:

☒ the international application as originally filedthe description ☐ as originally filed☐ as amended under Article 34the claims ☐ as originally filed☐ as amended under Article 19 (together with any accompanying statement)☐ as amended under Article 34the drawings ☐ as originally filed☐ as amended under Article 342. ☐ The applicant wishes any amendment to the claims under Article 19 to be considered as reversed.3. ☐ The applicant wishes the start of the international preliminary examination to be postponed until the expiration of 20 months from the priority date unless the International Preliminary Examining Authority receives a copy of any amendments made under Article 19 or a notice from the applicant that he does not wish to make such amendments (Rule 69.1(d)). *(This check-box may be marked only where the time limit under Article 19 has not yet expired.)*

* Where no check-box is marked, international preliminary examination will start on the basis of the international application as originally filed or, where a copy of amendments to the claims under Article 19 and/or amendments of the international application under Article 34 are received by the International Preliminary Examining Authority before it has begun to draw up a written opinion or the international preliminary examination report, as so amended.

Language for the purposes of international preliminary examination: English☒ which is the language in which the international application was filed.☐ which is the language of a translation furnished for the purposes of international search.☐ which is the language of publication of the international application.☐ which is the language of the translation (to be) furnished for the purposes of international preliminary examination.**Box No. V ELECTION OF STATES**The applicant hereby elects all eligible States *(that is, all States which have been designated and which are bound by Chapter II of the PCT)*

excluding the following States which the applicant wishes not to elect:

Box No. VI CHECK LIST

The demand is accompanied by the following elements, in the language referred to in Box No. IV, for the purposes of international preliminary examination:

- | | | |
|--|---|--------|
| 1. translation of international application | : | sheets |
| 2. amendments under Article 34 | : | sheets |
| 3. copy (or, where required, translation) of amendments under Article 19 | : | sheets |
| 4. copy (or, where required, translation) of statement under Article 19 | : | sheets |
| 5. letter | : | sheets |
| 6. other (specify) | : | sheets |

For International Preliminary Examining Authority use only

received not received

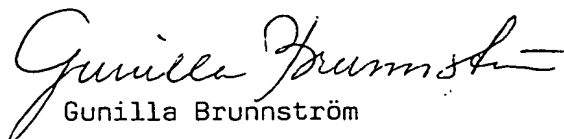
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>

The demand is also accompanied by the item(s) marked below:

- | | |
|--|---|
| 1. <input checked="" type="checkbox"/> fee calculation sheet | 4. <input type="checkbox"/> statement explaining lack of signature |
| 2. <input type="checkbox"/> separate signed power of attorney | 5. <input type="checkbox"/> nucleotide and or amino acid sequence listing in computer readable form |
| 3. <input type="checkbox"/> copy of general power of attorney; reference number, if any: | 6. <input type="checkbox"/> other (specify): |

Box No. VII SIGNATURE OF APPLICANT, AGENT OR COMMON REPRESENTATIVE

Next to each signature, indicate the name of the person signing and the capacity in which the person signs (if such capacity is not obvious from reading the demand).


Gunilla Brunnström

For International Preliminary Examining Authority use only

1. Date of actual receipt of DEMAND:

2. Adjusted date of receipt of demand due to CORRECTIONS under Rule 60.1(b):

3. ☐ The date of receipt of the demand is AFTER the expiration of 19 months from the priority date and item 4 or 5, below, does not apply. ☐ The applicant has been informed accordingly.

4. ☐ The date of receipt of the demand is WITHIN the period of 19 months from the priority date as extended by virtue of Rule 80.5.

5. ☐ Although the date of receipt of the demand is after the expiration of 19 months from the priority date, the delay in arrival is EXCUSED pursuant to Rule 82.

For International Bureau use only

Demand received from IPEA on:

PCT

FEE CALCULATION SHEET

Annex to the Demand for international preliminary examination

International application No. PCT/SE99/02175	For International Preliminary Examining Authority use only	
Applicant's or agent's file reference TP 1300 WO	Date stamp of the IPEA	
Applicant TETRA LAVAL HOLDINGS & FINANCE SA		
Calculation of prescribed fees		
1. Preliminary examination fee	4 200,-	<div style="border: 1px solid black; width: 20px; height: 15px; margin: 0 auto; line-height: 15px;">P</div>
2. Handling fee <i>(Applicants from certain States are entitled to a reduction of 75% of the handling fee. Where the applicant is (or all applicants are) so entitled, the amount to be entered at II is 25% of the handling fee.)</i>	1 270,-	<div style="border: 1px solid black; width: 20px; height: 15px; margin: 0 auto; line-height: 15px;">H</div>
3. Total of prescribed fees Add the amounts entered at P and H and enter total in the TOTAL box.....	<div style="border: 1px solid black; padding: 2px;">5 470,-</div>	
<div style="border: 1px solid black; text-align: center; padding: 2px;">TOTAL</div>		
Mode of Payment		
<input checked="" type="checkbox"/> authorization to charge deposit account with the IPEA (see below)	<input type="checkbox"/> cash	
<input type="checkbox"/> cheque	<input type="checkbox"/> revenue stamps	
<input type="checkbox"/> postal money order	<input type="checkbox"/> coupons	
<input type="checkbox"/> bank draft	<input type="checkbox"/> other (specify):	
Deposit Account Authorization <i>(this mode of payment may not be available at all IPEAs)</i>		
The IPEA/ <u>SE</u> <input checked="" type="checkbox"/> is hereby authorized to charge the total fees indicated above to my deposit account.		
<input type="checkbox"/> <i>(this check-box may be marked only if the conditions for deposit accounts of the IPEA so permit)</i> is hereby authorized to charge any deficiency or credit any overpayment in the total fees indicated above to my deposit account.		
164020	15.06.2000	Signature Gunilla Brunnström
Deposit Account Number	Date (day/month/year)	

REC'D 16 MAR 2001

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

PCT

(PCT Article 36 and Rule 70)

14

Applicant's or agent's file reference TP 1300 WO	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/SE99/02175	International filing date (day/month/year) 24.11.1999	Priority date (day/month/year) 25.11.1998
International Patent Classification (IPC) or national classification and IPC ⁷ F28F 9/02, F28D 7/16		
Applicant Tetra Laval Holdings & Finance SA et al		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 4 sheets, including this cover sheet.
- ☐ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).
- These annexes consist of a total of _____ sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 19.06.2000	Date of completion of this report 02.03.2001
Name and mailing address of the IPEA/SE Patent- och registreringsverket Box 5055 S-102 42 STOCKHOLM Facsimile No. 08-667 72 88	Authorized officer Annette Riedel / JA A Telephone No. 08-782 25 00

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/SE99/02175

I. Basis of the report

1. With regard to the **elements** of the international application:*

- ☒ the international application as originally filed
- ☐ the description:
 pages _____, as originally filed
 pages _____, filed with the demand
 pages _____, filed with the letter of _____
- ☐ the claims:
 pages _____, as originally filed
 pages _____, as amended (together with any statement) under article 19
 pages _____, filed with the demand
 pages _____, filed with the letter of _____
- ☐ the drawings:
 pages _____, as originally filed
 pages _____, filed with the demand
 pages _____, filed with the letter of _____
- ☐ the sequence listing part of the description:
 pages _____, as originally filed
 pages _____, filed with the demand
 pages _____, filed with the letter of _____

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language _____ which is:

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheet/fig _____

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2 (c)).**

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

** Any replacement sheet containing such amendments must be referred to under item I and annexed to this report.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/SE99/02175

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**1. Statement**

Novelty (N)	Claims	<u>1-6</u>	YES
	Claims		NO
Inventive step (IS)	Claims		YES
	Claims	<u>1-6</u>	NO
Industrial applicability (IA)	Claims	<u>1-6</u>	YES
	Claims		NO

2. Citations and explanations (Rule 70.7)

The invention relates to a heat exchanger with a plurality of heat exchanger modules carried on a frame and interconnected by means of tube bends. Every module comprises at least one heat exchanger tube sealed into end plates and enclosed in a mantle.

The object of the invention is to simplify assembly and provide a cheap and compact arrangement that can absorb thermal movements. This is achieved by flexibly connecting the end plates with adjacent end plates to form part of the frame.

In the International Search Report, three documents were considered particularly relevant (A-C), while documents D-F were cited to define the state of the art only.

A: SE 501908 C
B: WO 98/16971 A1
C: US 710810 A
D: GB 713718 A
E: GB 905076 A
F: AT 365774 C

Document A discloses a heat exchanger according to the preamble of claim 1, where the end portions of the mantles are provided with coupling parts (13). In this case, the flexibly connected sleeves (9) form the frame of the heat exchanger, supporting the mantle tubes at a distance from the ends. The flanges surrounding the end plates also appear to rest on each other (Figs. 2, 12 and 13).

.../...

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/SE99/02175

Supplemental Box

(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of: V.

Segmented end plates for tubular heat exchangers are previously known, see citations B and C. B discloses single-tube end plates constructed of modules that allow relative movement caused by thermal expansion. Through C, the principle of letting end pieces for concentric tubes form part of the frame is previously known. Parts corresponding to end plates for both the inner and outer tubes are integrated in the end piece. The object is to achieve a flexible construction and reduce the risk of leakage due to thermal movement. It would be obvious to a person skilled in the art, particularly in view of B or C, to construct the end plates in A in analogy with the supporting parts (9) in the same document. Consequently, claims 1, 3, 4 and 6 lack inventive step.

Elliptical tube bends according to the characterising portion of claim 2 are previously known in the art, see documents D-F. Choosing such a known tube bend for the heat exchanger in question must be obvious to a person skilled in the art. Likewise, the characterising portion of claim 5 defines a constructional and obvious feature only. Hence, claims 2 and 5 lack inventive step.

PATENT COOPERATION TREATY

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INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference TP 1300 WO	FOR FURTHER ACTION	see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.
International application No. PCT/SE 99/02175	International filing date (<i>day/month/year</i>) 24 November 1999	(Earliest) Priority Date (<i>day/month/year</i>) 25 November 1998
Applicant Tetra Laval Holdings & Finance SA et al		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 3 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

1. ☐ Certain claims were found unsearchable (See Box I).
2. ☐ Unity of invention is lacking (See Box II).
3. ☐ The international application contains disclosure of a nucleotide and/or amino acid sequence listing and the international search was carried out on the basis of the sequence listing

☐ filed with the international application.
☐ furnished by the applicant separately from the international application,

☐ but not accompanied by a statement to the effect that it did not include matter going beyond the disclosure in the international application as filed.

☐ transcribed by this Authority.
4. With regard to the title, ☒ the text is approved as submitted by the applicant.
☐ the text has been established by this Authority to read as follows:
5. With regard to the abstract,

☒ the text is approved as submitted by the applicant.
☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.
6. The figure of the drawings to be published with the abstract is:

Figure No. 1
☒ as suggested by the applicant.
☐ because the applicant failed to suggest a figure.
☐ because this figure better characterizes the invention.

☐ None of the figures.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE 99/02175

A. CLASSIFICATION OF SUBJECT MATTER

IPC7: F28F 9/02, F28D 7/16, F28F 9/26

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC7: F28F, F28D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	SE 501908 C2 (TETRA LAVAL HOLDINGS & FINANCE SA), 19 June 1995 (19.06.95) --	1-6
Y	WO 9816791 A1 (AALBORG INDUSTRIES A/S), 23 April 1998 (23.04.98), figure 11, page 4, last paragraph --	1-6
Y	US 710810 A (J. SCHNEIBLE), 7 December 1902 (07.12.02), page 1, line 23 - line 36; page 1, line 40 - line 44, figures 1,4,5 --	1-6
A	GB 905076 A (BABCOCK & WILCOX LIMITED), 5 Sept 1962 (05.09.62) --	2

☒ Further documents are listed in the continuation of Box C.☒ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

16 February 2000

Date of mailing of the international search report

14 -03- 2000

Name and mailing address of the ISA/
Swedish Patent Office
Box 5055, S-102 42 STOCKHOLM
Facsimile No. +46 8 666 02 86

Authorized officer

Annette Riedel / JA A
Telephone No. +46 8 782 25 00

INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE 99/02175

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	GB 713718 A (JUNKRES & CO. G.M.B.H.), 18 August 1954 (18.08.54) --	2
A	AT 365774 C (VEREINIGTE METALLWERKE RANSHOFEN-BERNDORF AKTIENGESELLSCHAFT), 10 February 1982 (10.02.82) --	2
A	US 663602 A (E.W. DEMING), 11 December 1900 (11.12.00) --	
A	US 2099493 A (J.C. MAHONEY), 16 November 1937 (16.11.37), figure 6 --	
A	US 5121791 A (CASTERLINE), 16 June 1992 (16.06.92) --	
A	US 1790151 A (H.W. HOW), 27 January 1931 (27.01.31) -- -----	

INTERNATIONAL SEARCH REPORT

Information on patent family members

02/12/99

International application No.

PCT/SE 99/02175

Patent document cited in search report			Publication date	Patent family member(s)		Publication date
SE	501908	C2	19/06/95	AT	168463 T	15/08/98
				AU	675001 B	16/01/97
				AU	7591894 A	11/05/95
				BR	9404175 A	27/06/95
				CA	2117930 A	22/04/95
				CN	1107575 A	30/08/95
				DE	69411664 D,T	05/11/98
				EP	0650025 A,B	26/04/95
				SE	0650025 T3	
				ES	2119042 T	01/10/98
				JP	7167583 A	04/07/95
				SE	9402029 A	22/04/95
				US	5586599 A	24/12/96
				SE	9303466 D	00/00/00
				ZA	9408170 A	18/04/96
WO	9816791	A1	23/04/98	AU	4452697 A	11/05/98
US	710810	A	07/12/02	NONE		
GB	905076	A	05/09/62	NONE		
GB	713718	A	18/08/54	NONE		
AT	365774	C	10/02/82	AT	433180 A	15/06/81
US	663602	A	11/12/00	NONE		
US	2099493	A	16/11/37	NONE		
US	5121791	A	16/06/92	US	5228191 A	20/07/93
				AU	7035591 A	16/05/91
				CA	2025651 A	17/04/91
				US	5063663 A	12/11/91
				WO	9105633 A	02/05/91
US	1790151	A	27/01/31	NONE		